

WHAT IS CLAIMED IS:

1. A protecting element comprising:

a first high concentration impurity region, having two side surfaces;

5 a second high concentration impurity region, disposed so as to oppose one side surface of the first high concentration impurity region and being adequately wider in width than the first high concentration impurity region;

an insulating region, disposed at the periphery of the first and second high concentration impurity regions;

10 a first current path, formed in the insulating region between opposing surfaces of the first and second high concentration impurity regions and between vicinities of bottom surfaces of both of the regions and serving as a path for electron current and hole current; and

a second current path, formed in the insulating region so as to detour from the second high concentration impurity region to the other side surface of the first high concentration impurity region through regions adequately deeper than the first and second high concentration impurity regions and serving as a path for electron current and hole current; wherein

the first and second high concentration impurity regions are arranged as two terminals for connection in parallel between two terminals of a protected element and

20 electrostatic energy that is applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.

2. The protecting element of claim 1, wherein an extension part of the first high concentration impurity region is provided by bending the first high concentration impurity region in an alienating direction from the opposing surface with respect to the second high concentration impurity region and a third current path, which is to serve as a path for electron current and hole current, is formed in the insulating region between the extension part and the second high concentration impurity region.

3. A protecting element comprising:

a first high concentration impurity region, having two side surfaces;

a second high concentration impurity region, having two side surfaces and having one side surface disposed so as to mutually oppose one side surface of the first high concentration impurity region and also having a width equivalent to the width of the first high concentration impurity region;

5 an insulating region, disposed at the periphery of the first and second high concentration impurity regions;

a first current path, formed in the insulating region between opposing surfaces of the first and second high concentration impurity regions and between the vicinities of the bottom surfaces of both of the regions and serving as a path for electron current and hole current; and

10 a second current path, formed in the insulating region so as to detour from the other side surface of the second high concentration impurity region to the other side surface of the first high concentration impurity region through regions adequately deeper than the first and second high concentration impurity regions current path and serving as a path for electron current and hole current; wherein

15 the first and second high concentration impurity regions are arranged as two terminals for connection in parallel between two terminals of a protected element and

electrostatic energy that is applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.

20 4. The protecting element of claim 3, wherein an extension part of the first high concentration impurity region is provided by bending the first high concentration impurity region in an alienating direction from the opposing surface with respect to the second high concentration impurity region and a third current path, which is to serve as a path for electron current and hole current, is formed in the insulating region between the extension part and the
25 second high concentration impurity region.

5. The protecting element of claim 3, wherein an extension part of the second high concentration impurity region is provided by bending the second high concentration impurity
30 region in an alienating direction from the opposing surface with respect to the first high concentration impurity region and a third current path, which is to serve as a path for electron

current and hole current, is formed in the insulating region between the extension part and the first high concentration impurity region.

6. The protecting element of claim 1 or 3, wherein a width of the first high
5 concentration impurity region is 5 μm or less.

7. The protecting element of claim 1 or 3, wherein the second current path has a far
higher conductivity modulation efficiency than the first current path of the protecting element
without the second current path.

10 8. The protecting element of claim 1 or 3, wherein a current value that passes through
the second current path is equal to or greater than a current value that passes through the first
current path.

15 9. The protecting element of claim 1 or 3, wherein the second current path is formed by
securing a width of 10 μm or more from the other side surface of the first high concentration
impurity region.

20 10. The protecting element of claim 1 or 3, wherein the second current path is formed
by securing a width of 20 μm or more in the depth direction from bottom parts of the first and
second high concentration impurity regions.

25 11. The protecting element of claim 1 or 3, wherein the second current path is improved
in conductivity modulation efficiency by spreading greatly the current path in accordance with
an increase in the electrostatic energy.

30 12. The protecting element of claim 1 or 3, wherein a capacitance between the first high
concentration region and the second high concentration region is 40 fF or less, and by connecting
two terminals of the first high concentration region and the second high concentration region in
parallel between two terminals of the protected element, the electrostatic breakdown voltage is
improved by ten times or more in comparison to prior to connection.

13. The protecting element of claim 2, 4 or 5, wherein the third current path has a far higher conductivity modulation efficiency than the first current path.

14. The protecting element of claim 2, 4 or 5, wherein the third current path is formed
5 by securing a width of 10 μm or more from a side surface of the bent part.

15. The protecting element of claim 2, 4 or 5, wherein the third current path is improved in conductivity modulation efficiency by spreading greatly the current path in accordance with an increase in the electrostatic energy.

10

16. A protecting element comprising:
a first high concentration impurity region;
a second high concentration impurity region; and
an insulating region disposed at the periphery of and in contact with the first and second
15 high concentration impurity regions; wherein

with at least one of either of the first and second high concentration impurity regions, 10 μm or more of the insulating region is secured from a side opposite surface where the high concentration impurity regions oppose each other,

the first and second high concentration impurity regions are arranged as two terminals
20 and connected in parallel between two terminals of a protected element having a PN junction or Schottky junction, and

electrostatic energy applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.

25

17. A protecting element comprising:
a first high concentration impurity region;
a second high concentration impurity region; and
an insulating region disposed at the periphery of and in contact with the first and second
30 high concentration impurity regions; wherein

with at least one of either of the first and second high concentration impurity regions, 10

μm or more of the insulating region is secured from the side opposite surface where the high concentration impurity regions oppose each other,

the first and second high concentration impurity regions are arranged as two terminals and connected in parallel between two terminals of a protected element forming a capacitor, and

5 electrostatic energy applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.

18. A protecting element comprising:

10 a first high concentration impurity region;

a second high concentration impurity region; and

an insulating region disposed at the periphery of and in contact with the first and second high concentration impurity regions; wherein

15 $10\ \mu\text{m}$ or more of the insulating region is secured in the direction of extension of surfaces where the first and second high concentration impurity regions oppose each other,

the first and second high concentration impurity regions are arranged as two terminals and connected in parallel between two terminals of a protected element having a PN junction or Schottky junction, and

20 electrostatic energy applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.

19. A protecting element comprising:

a first high concentration impurity region;

25 a second high concentration impurity region; and

an insulating region disposed at the periphery of and in contact with the first and second high concentration impurity regions; wherein

$10\ \mu\text{m}$ or more of the insulating region is secured in the direction of extension of surfaces where the first and second high concentration impurity regions oppose each other,

30 the first and second high concentration impurity regions are arranged as two terminals and connected in parallel between two terminals of a protected element forming a capacitor, and

electrostatic energy applied between the two terminals of the protected element is discharged between the first and second high concentration impurity regions and the electrostatic energy is thereby attenuated.